



Aerojet Boundary Operable Unit Feasibility Study Update

Community Advisory Group Meeting
December 6, 2011



Presentation Content

- Boundary Operable Unit Risk Assessment
 - process and history
- Feasibility study overview
- Path forward
 - Proposed Plan
 - Record of Decision



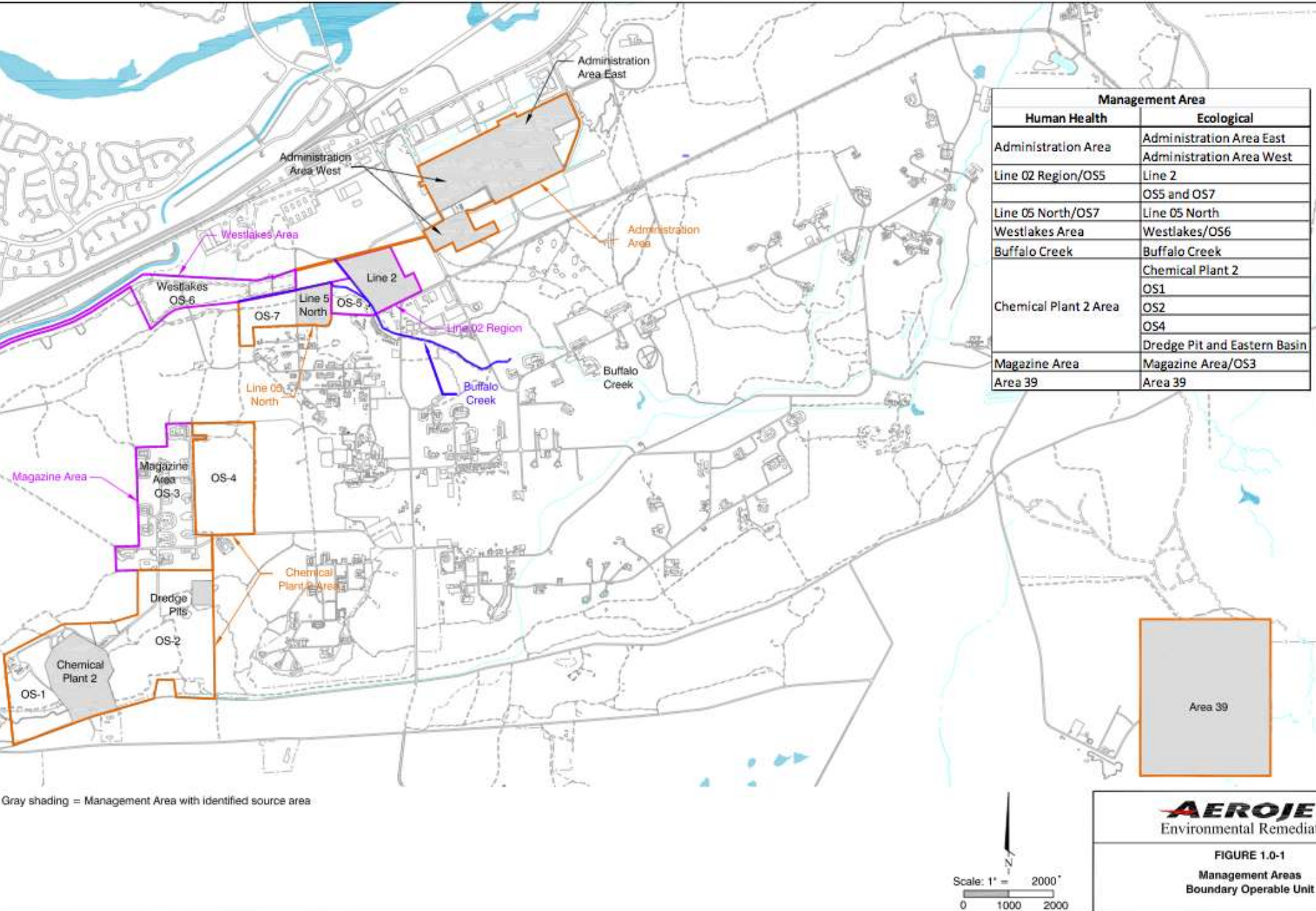
Human Health Risk Assessment

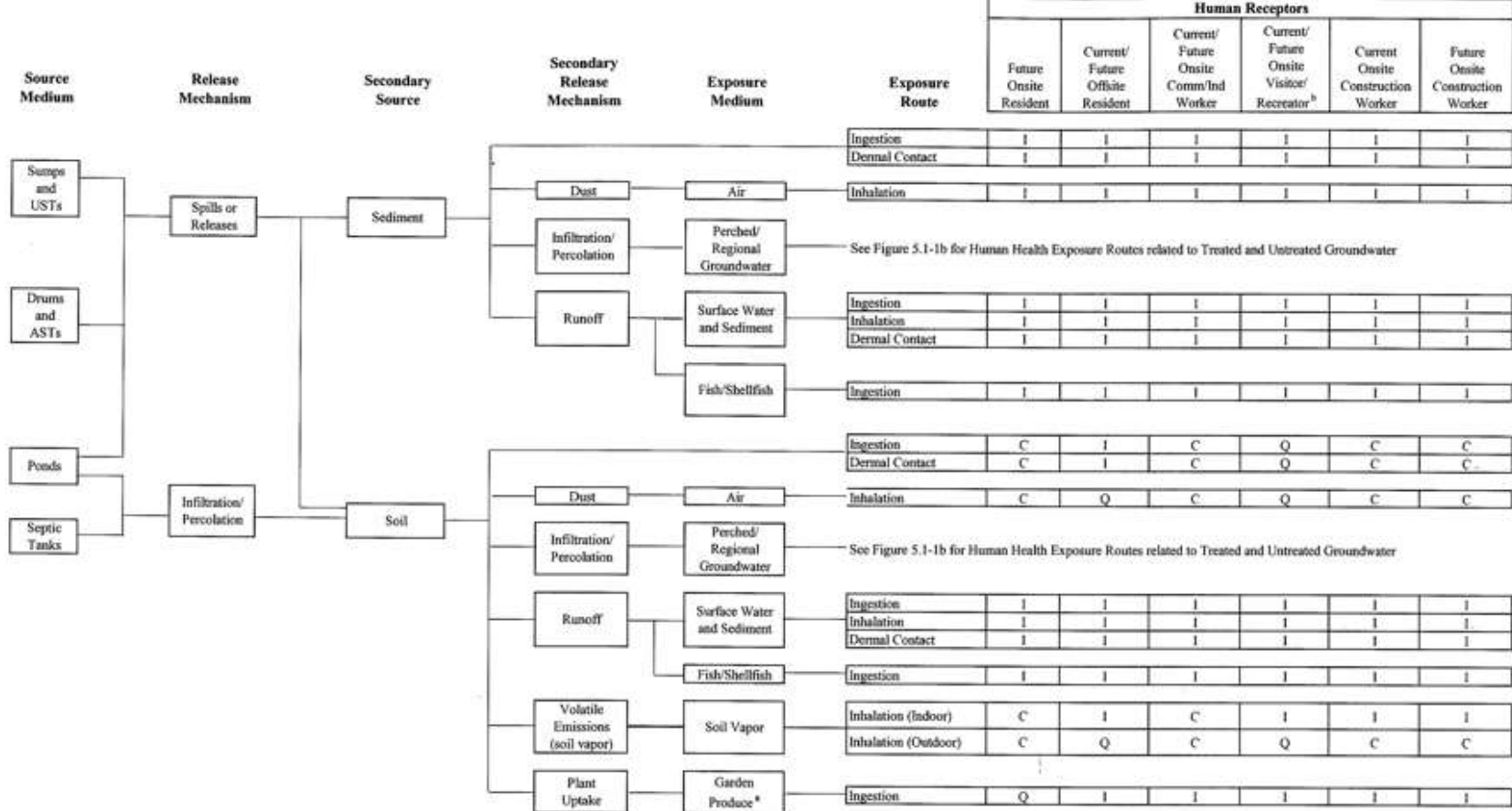
- Presents an evaluation of the potential exposure of receptors to soil, sediment, surface water, and soil vapor
- Includes use of untreated groundwater for residential supply and the potential for migration of VOC from groundwater into indoor and ambient air, under both current and future land-use scenarios.



Risk Assessment Basis

- EPA's Risk Assessment Guidance for Superfund
- Superfund Exposure Assessment Manual
- Regional Screening Levels (PRGs)
- Draft Guidance for Evaluating Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils Supplemental
- Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities
- Preliminary Endangerment Assessment Guidance Manual



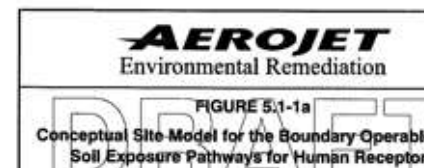


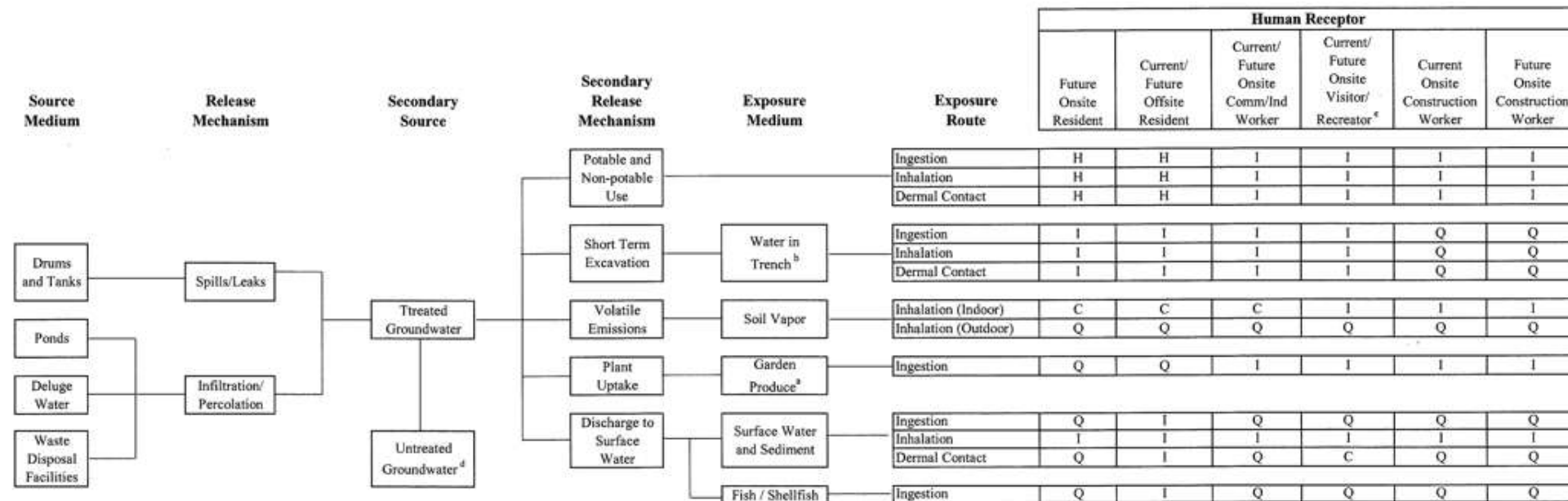
Notes and Key:

- a Projected residential redevelopment at Aerojet is not likely to include land-intensive pathways, such as in-situ gardening. The naturally occurring soil at Aerojet is not suited for this type of activity. Significant land preparation activities (i.e., addition of topsoil and nutrients) would be required prior to growing fruits or vegetables.
- b Since a residential and/or commercial/industrial soil exposure will be evaluated for all the source sites, there is no need to quantify a separate visitor/recreational exposure for all areas. However, a recreational exposure scenario will be evaluated for Area 39 and Buffalo Creek. Exposures to fish on the Aerojet property are highly unlikely, and are dependent upon the presence of edible species that are of large enough size to be filleted.

ASTs Above-ground Storage Tank
 C Complete exposure pathway evaluated quantitatively
 Comm/Ind Commercial/Industrial

I Incomplete exposure pathway
 USTs Underground Storage Tank
 Q Qualitative (not quantitative) evaluation conducted for this potentially complete exposure pathway





Notes and Key:

- a Projected residential redevelopment at Aerojet is not likely to include land-intensive pathways, such as in-situ gardening. The naturally occurring soil at Aerojet is not suited for this type of activity. Significant land preparation activities (i.e., addition of topsoil and nutrients) would be required prior to growing fruits or vegetables.
- b Although construction workers may briefly encounter the shallow water table in some OUs, construction activities in saturated trench conditions are generally avoided and dewatering is performed to avoid work in a wet and slippery trench. Dermal exposures to contaminants in trench water would be incomplete as steady state absorption and penetration of the skin is unlikely, given short exposure times.
- c Recreational exposure will be evaluated on a site-specific basis; if a residential and/or commercial/industrial soil exposure has already been evaluated, there is no need to quantify a separate recreational exposure to soil unless the property may be transferred solely for recreational use. Exposures to fish on the Aerojet property are highly unlikely, and are dependent upon the presence of edible species that are of large enough size to be filleted.
- d No discharge of untreated groundwater to surface water bodies identified in BOU.

C	Complete exposure pathway evaluated quantitatively
Comm/Ind	Commercial/Industrial
H	Hypothetically complete in absence of institutional controls
I	Incomplete exposure pathway
Q	Qualitative (not quantitative) evaluation conducted for this potentially complete exposure pathway



Human Health Chemicals of Potential Concern

Area	Groundwater	Soil Vapor	Soil
Administration Area East Administration Area West	X	PCE TCE Vinyl Chloride Benzene 2-propanol	PCB Metals PAH 1,1,2,2-PCA
Line 2 Region/OS5	X	TCE	Metals PAH
Line 5 N/OS7	X	PCE TCE	--
Buffalo Creek	X	--	Metals
Westlakes/OS6	--	--	--
Magazine Area/OS3	--	X	--
Chemical Plant 2 OS1/OS2/OS4 Dredge Pit and Eastern Basin	X	1,2-DCA Vinyl Chloride	PCB PCP PAH Metals Prowl
Area 39	--	PCE TCE 1,1-DCE	Metals Dioxin



Protection of Ground Water Chemicals of Potential Concern

Area	Soil Vapor	Soil	
Administration Area East	PCE	PCB	Perchlorate
Administration Area West	TCE	Metals	TPH-D
	Vinyl Chloride	PAH	TPH-MO
	Benzene		
	2-propanol		
Line 2 Region/OS5	TCE	Metals	NDMA
		PAH	TPH-D
		Perchlorate	TPH-MO
Line 5 N/OS7	PCE	Metals	TPH-D
	TCE	PAH	TPH-MO
		Perchlorate	
Buffalo Creek	--	PCB	
Westlakes/OS6	--	PCB	Perchlorate
		PAH	
Magazine Area/OS3	X	Metals	Perchlorate
Chemical Plant 2	1,2-DCA	PCB	Perchlorate
OS1/OS2/OS4	Vinyl Chloride	PCP	Pesticides
Dredge Pit and Eastern Basin		PAH	Prowl
		Metals	
Area 39	PCE	Metals	
	TCE	Perchlorate	
	1,1-DCE		

Legend

Soil Non-Cancer HIs (Direct)

- Location Not Quantified - No COPCs
- HI ≤ 1.0
- HI > 1.0

Soil Vapor Non-Cancer HIs (Indoor Air)

- ◇ Location Not Quantified - No COPCs
- ◆ HI ≤ 1.0
- ◆ HI > 1.0

Groundwater Non-Cancer HIs (Indoor Air)

- ⊕ Location Not Quantified - No COPCs
- ⊕ HI ≤ 1.0
- ⊕ HI > 1.0

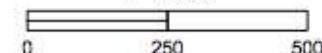
Surface Water Non-Cancer HIs (Direct)

- ▲ Location Not Quantified - No COPCs
- ▲ HI ≤ 1.0
- ▲ HI > 1.0

- Non-Cancer HI > 1.0 Risk Contour

Note: Some symbols may overlap and hide other symbols beneath them. Risk contours take into account all media, so therefore the contours may appear to be beyond what the symbols would indicate; however, this is due to a symbol that is hidden from view.

1" = 250'



AEROJET
Environmental Remediation

Figure 5.2-1
Residential
Non-Cancer Effects - All Media
Administration Area East

Legend

Soil Cancer Risks (Direct)

- Location Not Quantified - No COPCs
- ≤ 1E-6
- > 1E-6 and ≤ 1E-5
- > 1E-5 and ≤ 1E-4
- > 1E-4

Soil Vapor Cancer Risks (Indoor Air)

- ◇ Location Not Quantified - No COPCs
- ◇ ≤ 1E-6
- ◇ > 1E-6 and ≤ 1E-5
- ◇ > 1E-5 and ≤ 1E-4
- ◇ > 1E-4

Groundwater Cancer Risks (Indoor Air)

- ⊕ Location Not Quantified - No COPCs
- ⊕ ≤ 1E-6
- ⊕ > 1E-6 and ≤ 1E-5
- ⊕ > 1E-5 and ≤ 1E-4
- ⊕ > 1E-4

Surface Water Cancer Risks (Direct)

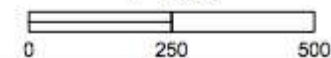
- ▲ Location Not Quantified - No COPCs
- ▲ ≤ 1E-6
- ▲ > 1E-6 and ≤ 1E-5
- ▲ > 1E-5 and ≤ 1E-4
- ▲ > 1E-4

— Cancer Risk > 10⁻⁶ Contour

- - - Cancer Risk > 10⁻⁴ Contour

Note: Some symbols may overlap and hide other symbols beneath them. Risk contours take into account all media, so therefore the contours may appear to be beyond what the symbols would indicate; however, this is due to a symbol that is hidden from view.

1" = 250'



AEROJET
Environmental Remediation

Figure 5.2-2
Residential
Cancer Risks - All Media
Administration Area East

DRAFT



Ecological Risk Assessment

Screening-level characterization of potential risks to ecological receptors that may be exposed to chemicals in soil, soil vapor, sediment, and surface water under both current and future land-use scenarios at the source areas within the BOU.



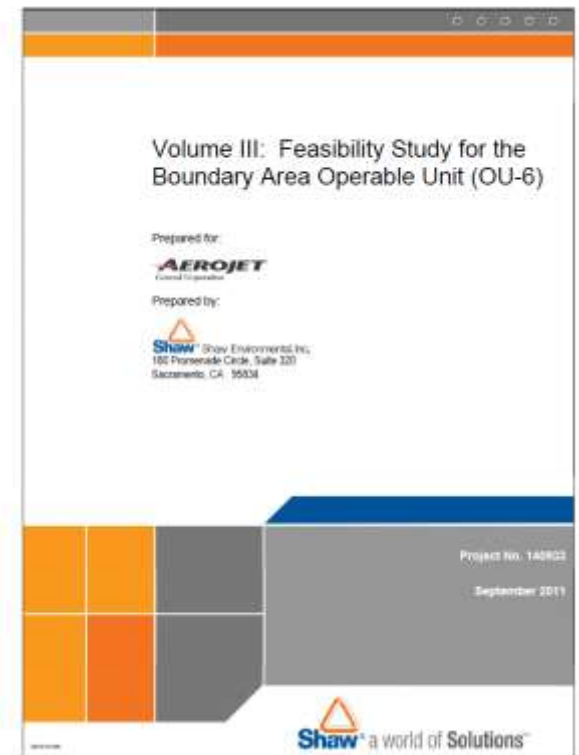
Eco Risk Assessment Basis

- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments Guidelines for Ecological Risk Assessment* (USEPA 1998),
- *Assessment and Risk Management Principles for Superfund Sites* (USEPA 1999),
- *The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments* (USEPA 2001c),



Path to the Revised Feasibility Study

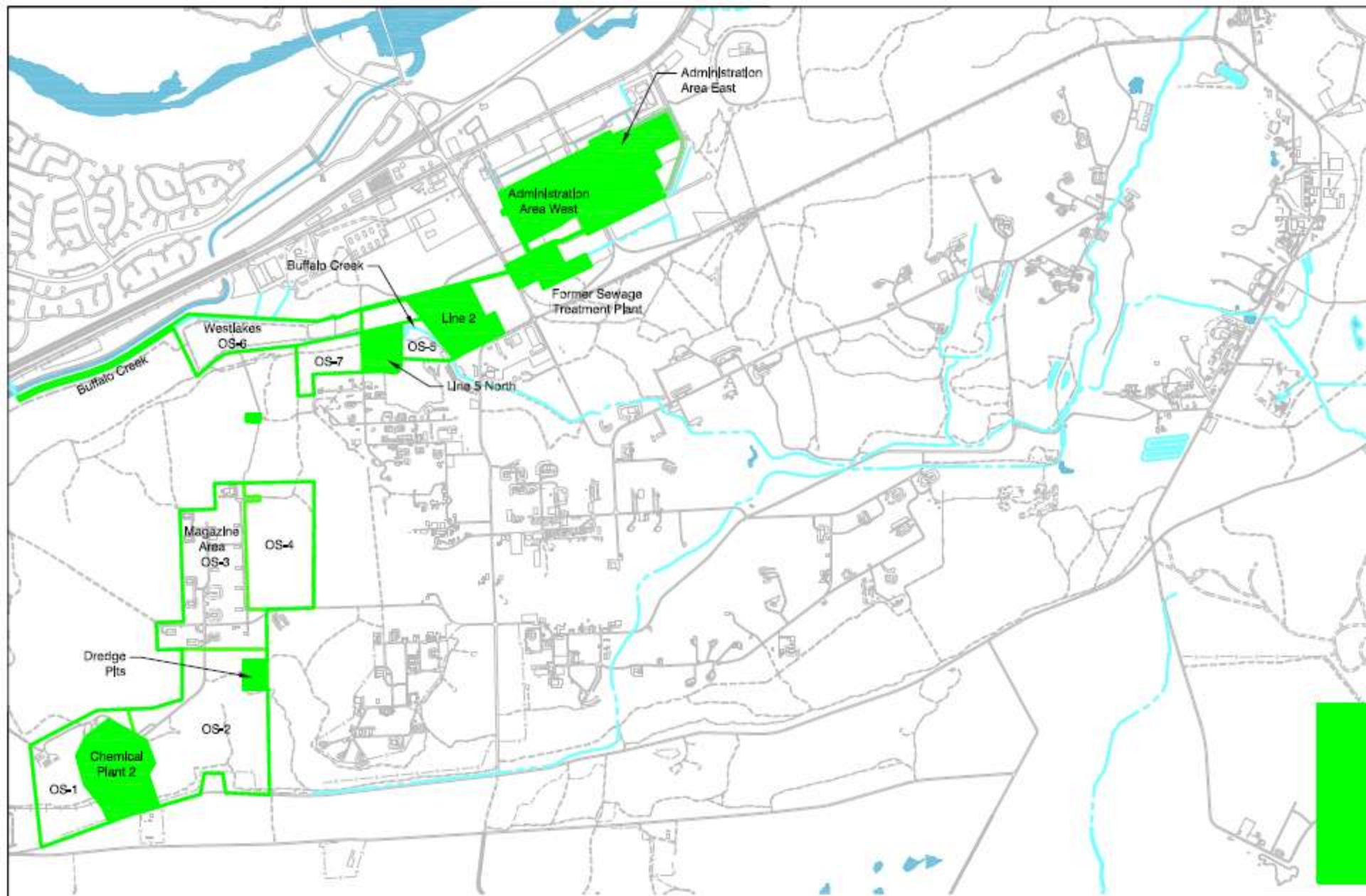
- Draft Sampling Plan 12/7/05
- Final Sampling Plan 7/31/06
- Draft RI/FS Report 11/28/08
- Final RI/Report 9/1/11
- Revised FS Report 9/29/11





Current Status

- Revised FS is in review by the Agencies
- Preliminary discussion at October 18 Agency meeting
- Revised figures provided by Aerojet November 16
- Conference call discussion November 18
- Technical Meeting December 6

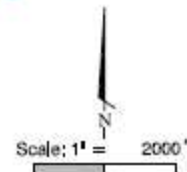


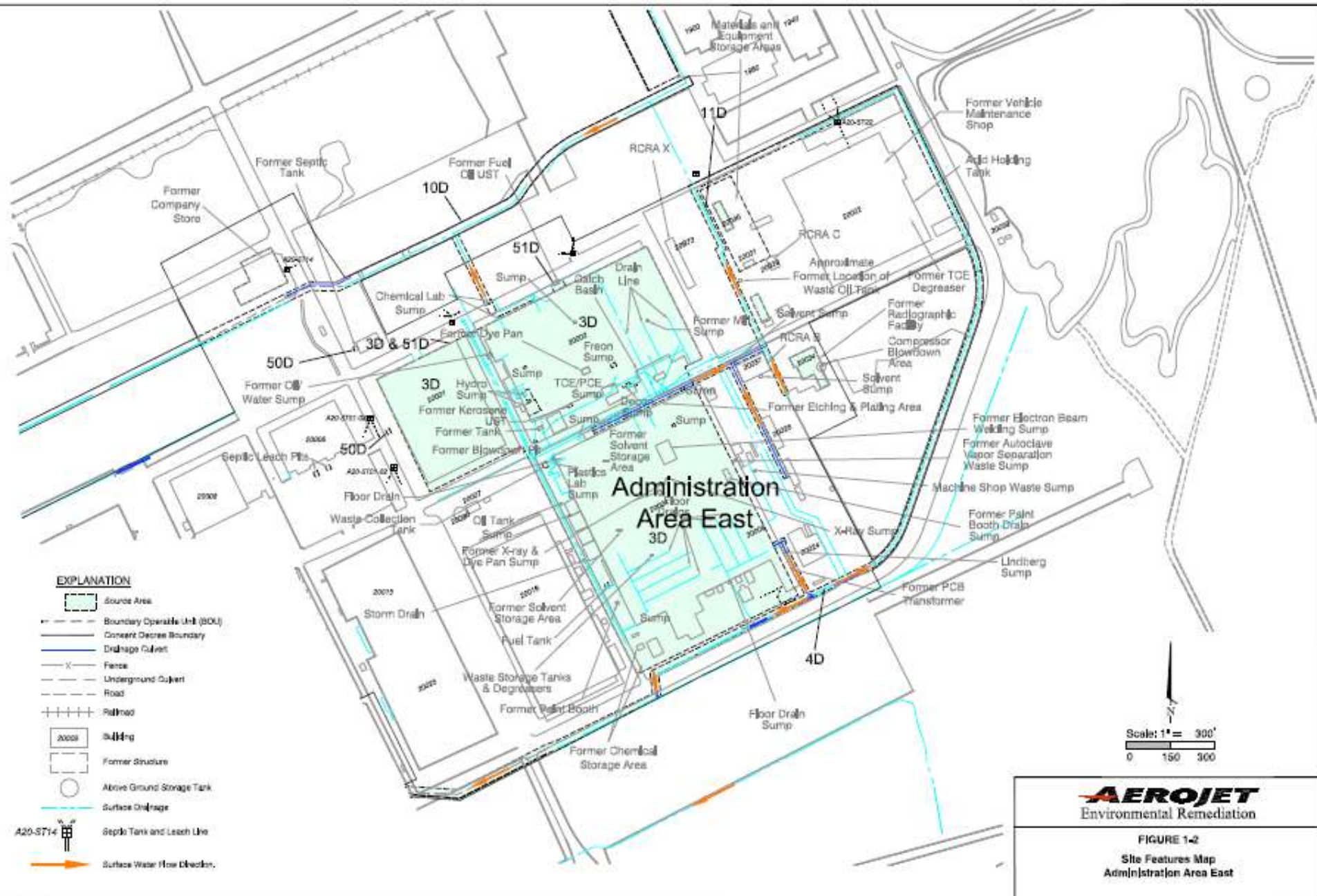
EXPLANATION

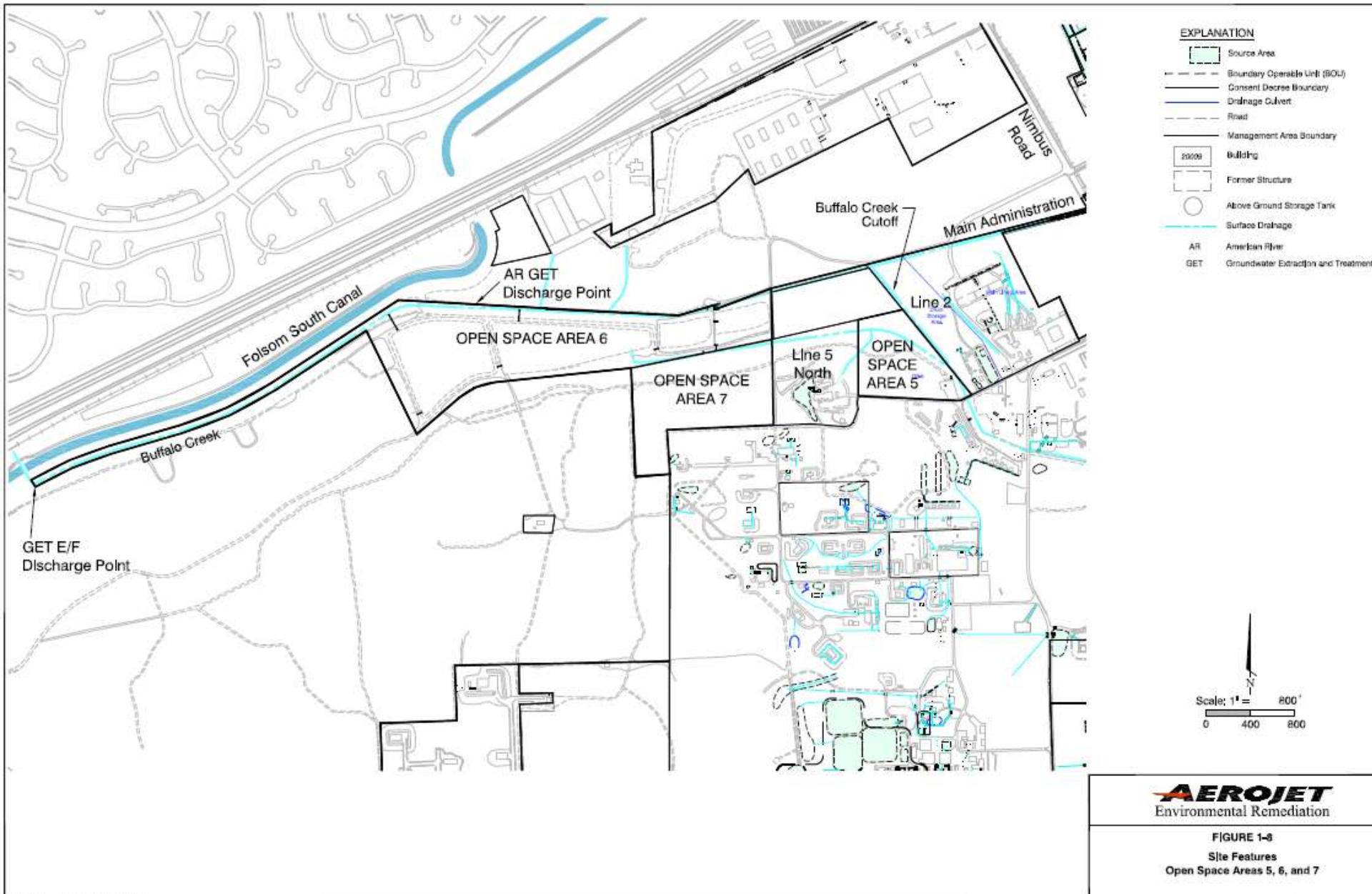


Management Area Containing Source Sites

Open Space (OS) Area









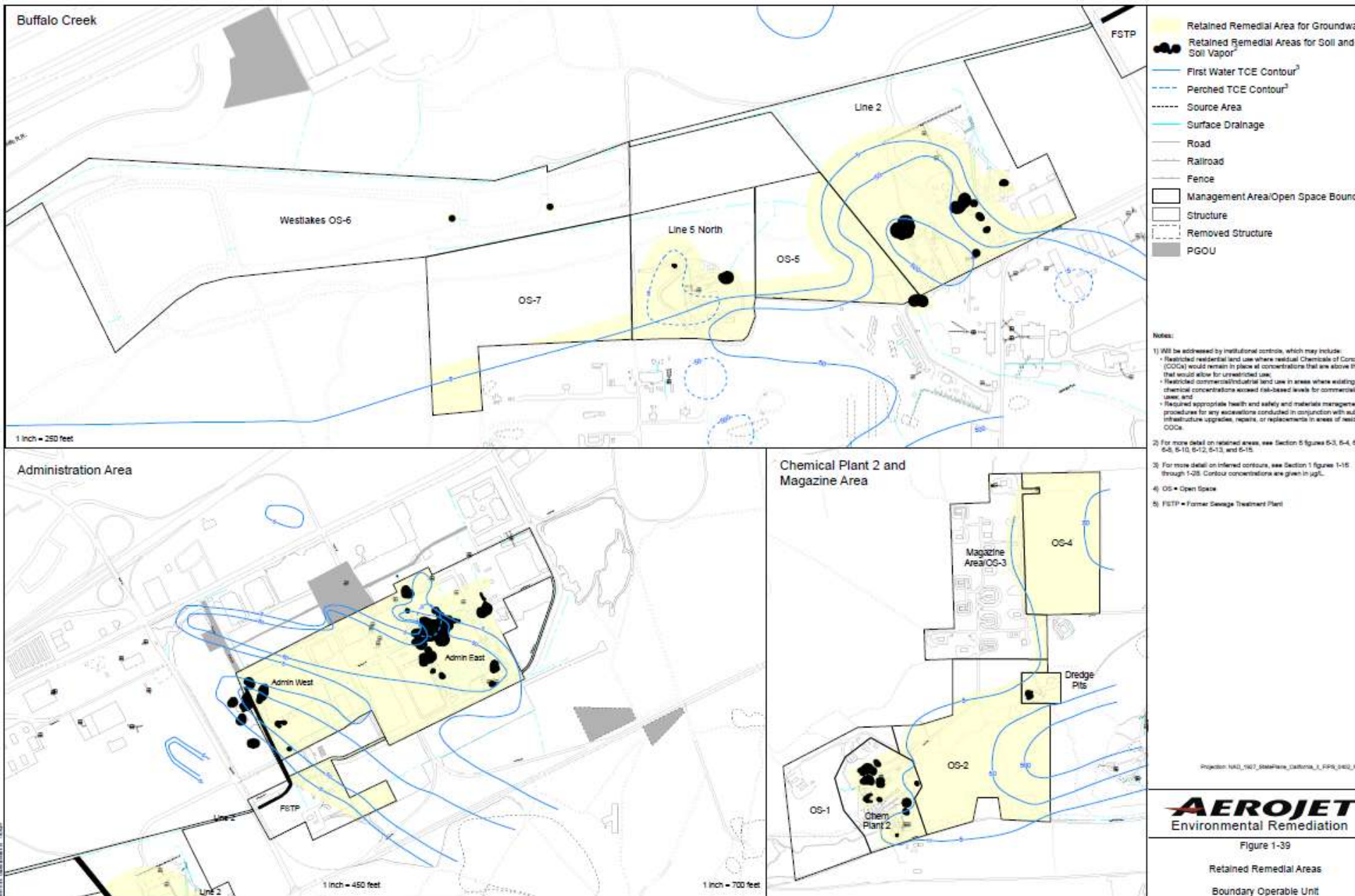
Summary of Risks

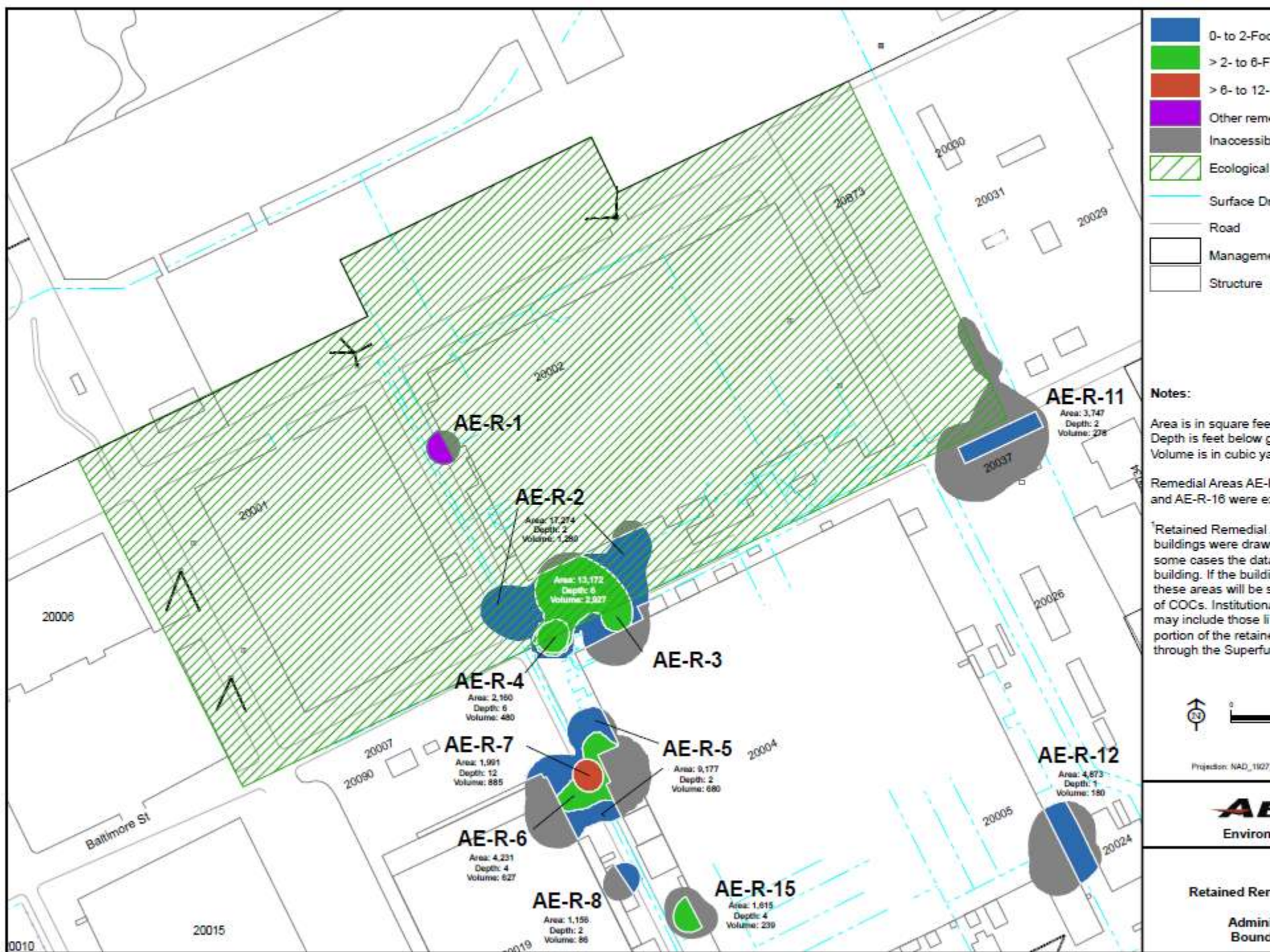
- Figure 1-39 from Feasibility Study
- [Final BOU FS/SR10131248_FIG_1-29.pdf](#)



Risks and Rationale for Action

- [Final BOU FS/Tables 1-3 to 1-10.pdf](#)







Next Steps

- Agencies' comments next week
- Aerojet to revise FS
- EPA preparing Proposed Plan
- Public Hearing



Discussion